Wind Power GeoPlanner™

Off-Air TV Analysis

Crocker Wind Farm

Prepared on Behalf of
Crocker Wind Farm, LLC

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COMSEARCH®
A CommScope Company

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1. Introduction

Off-air television stations broadcast signals from terrestrially-based facilities directly to television receivers. Comsearch identified those off-air stations whose service could potentially be affected by the proposed Crocker Wind Farm project in Clark County, South Dakota. Comsearch then examined the coverage of the stations and the communities in the area that could potentially have degraded television reception due to the location of the proposed wind turbines.

2. Summary of Results

The proposed wind energy project area and local communities are depicted in Figure 1, below.

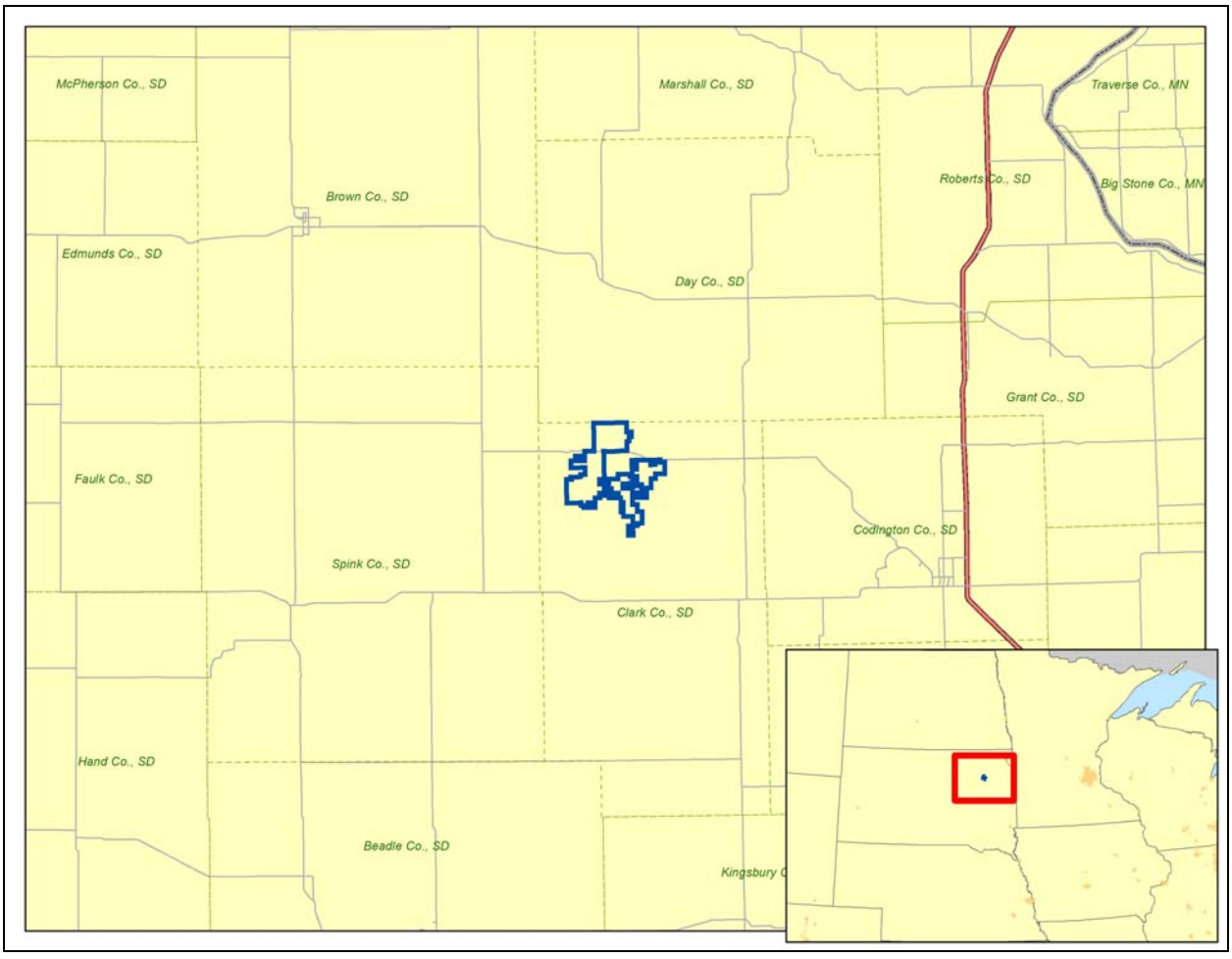

Figure 1: Wind Farm Project Area and Local Communities

To begin the analysis, Comsearch compiled all off-air television stations[1] within 150 kilometers of the center of the project area of interest (AOI). Appendix A contains a tabular summary of these stations. A plot depicting their locations appears in Figure 2, below.

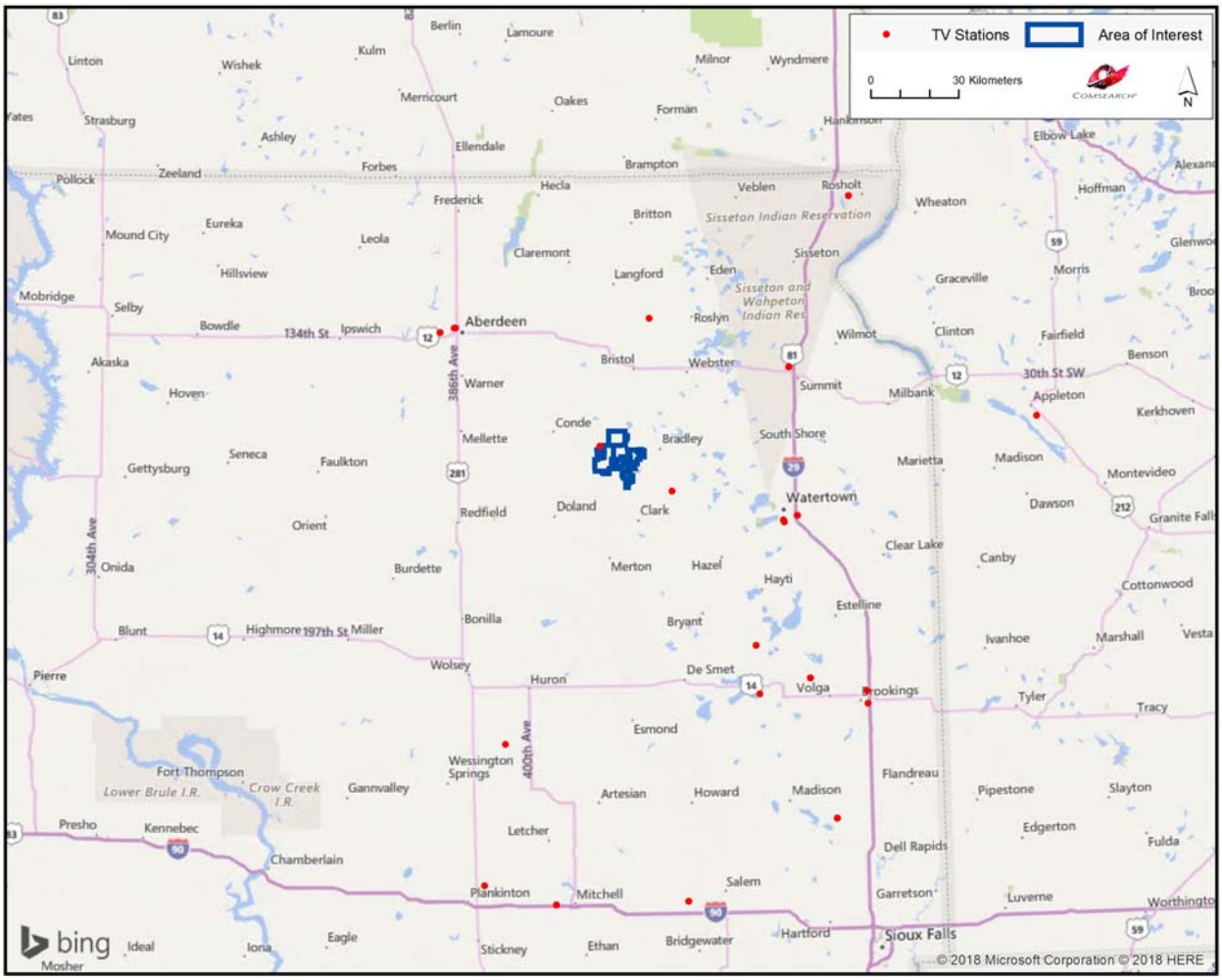

Figure 2: Plot of Off-Air TV Stations within 150 Kilometers of Project Area

TV stations at a distance of 100 kilometers or less are the most likely to provide off-air coverage to the project area and neighboring communities. These stations are listed in Table 1, below, and a plot depicting their locations is provided in Figure 3. There are a total of thirty-one database records for stations within approximately 100 kilometers of the project. Of these stations, only fourteen are currently licensed and operating, nine of which are low-power stations or translators. Translator stations are low-power stations that receive signals from

[1] Comsearch makes no warranty as to the accuracy of the data included in this report beyond the date of the report. The data presented in this report is derived from the TV station's FCC license and governed by Comsearch's data license notification and agreement located at http://www.comsearch.com/files/data_license.pdf.

distant broadcasters and retransmit the signal to a local audience. These stations serve local audiences and have limited range, which is a function of their transmit power and the height of their transmit antenna.

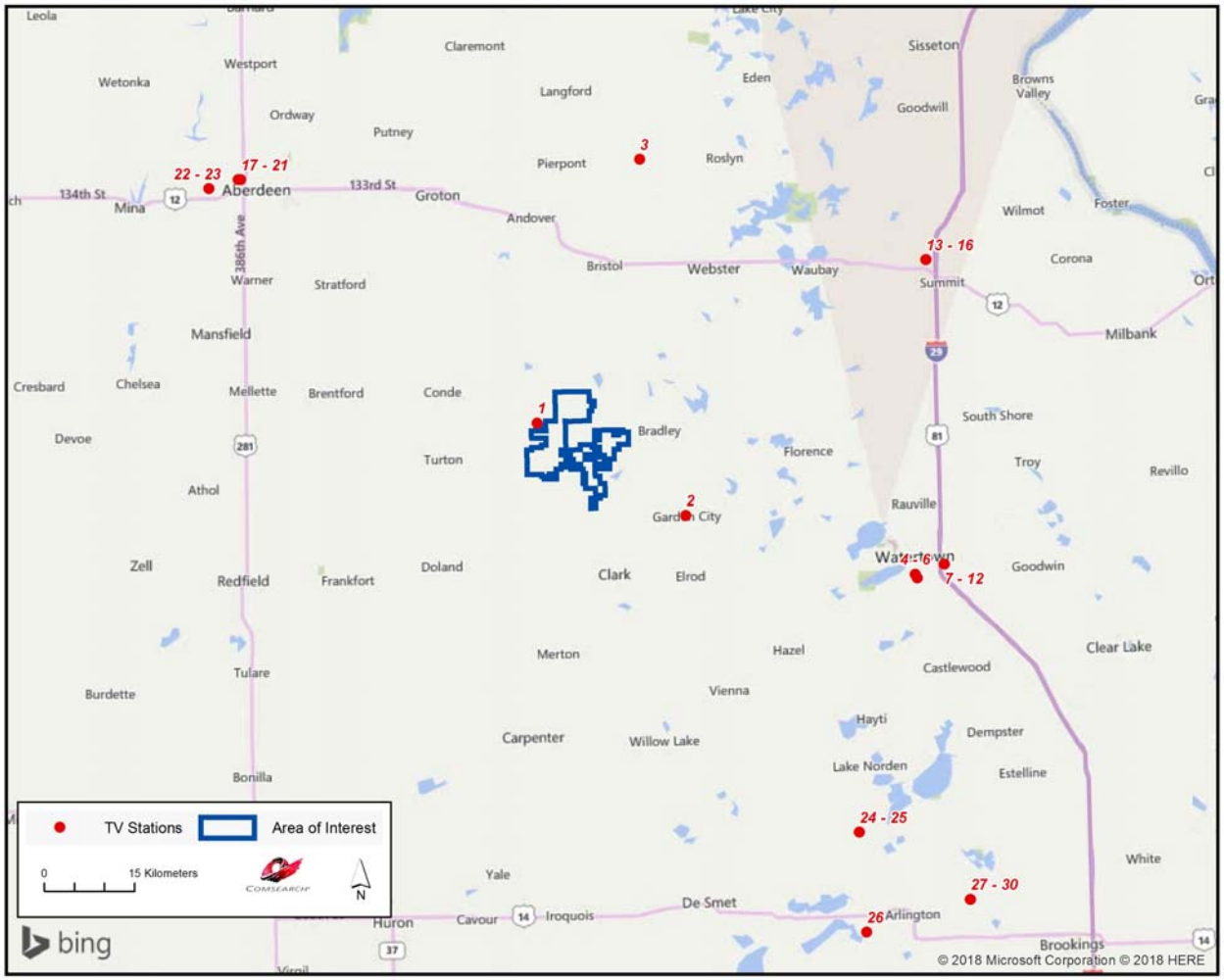

Figure 3: Plot of Off-Air TV Stations within 100 Kilometers of Project Area

ID	Call Sign	Status	Service[2]	Channel	Transmit ERP[3] (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Nearest Turbine (km)
1	KABY-TV	LIC	DT	9	19.4	45.106389	-97.899444	1.54
2	KDLO-TV	LIC	DT	3	14.4	44.965556	-97.589722	14.24
3	KDSD-TV	LIC	DT	17	37.82	45.498333	-97.674722	39.98
4	K42FI-D	LIC	TX	42	10.0	44.871111	-97.109722	53.29
5	K42FI-D	LIC	LD	42	6.516	44.871111	-97.109722	53.29
6	K32DK-D	LIC	LD	32	2.28	44.865556	-97.105833	53.84
7	K19KH-D	CP	LD	19	2.0	44.884889	-97.048306	57.07
8	K20KZ-D	CP	LD	20	2.0	44.884889	-97.048306	57.07
9	K22KF-D	CP	LD	22	15.0	44.884889	-97.048306	57.07
10	K23LI-D	CP	LD	23	15.0	44.884889	-97.048306	57.07
11	K30LU-D	CP	LD	30	2.0	44.884889	-97.048306	57.07
12	K39LN-D	CP	LD	39	2.0	44.884889	-97.048306	57.07
13	K14OP-D	CP	LD	14	1.0	45.339583	-97.071694	58.17
14	K25MD-D	CP	LD	25	1.0	45.339583	-97.071694	58.17
15	K32KJ-D	CP	LD	32	1.0	45.339583	-97.071694	58.17
16	K35KS-D	CP	LD	35	1.0	45.339583	-97.071694	58.17
17	K24DT-D	LIC	TX	24	0.674	45.474694	-98.521750	63.75
18	K24DT-D	LIC	LD	24	0.737	45.474722	-98.527222	64.10
19	K33MI-D	LIC	LD	33	15.0	45.474722	-98.527222	64.10
20	K39CZ-D	CP	LD	39	2.28	45.474722	-98.527222	64.10
21	K39CZ-D	LIC	LD	39	2.27	45.474722	-98.527222	64.10
22	K14OJ-D	CP	LD	14	15.0	45.461306	-98.589056	67.37
23	K15IR-D	CP	LD	15	15.0	45.461306	-98.589056	67.37
24	K35GR-D	LIC	TX	35	11.9	44.487500	-97.239167	70.59
25	K35GR-D	LIC	LD	35	6.76	44.487500	-97.239167	70.59
26	KESD-TV	LIC	DT	8	15.0	44.337778	-97.228611	85.05
27	K27LB-D	CP	LD	27	2.0	44.383222	-97.010500	90.98
28	K38NI-D	CP	LD	38	2.0	44.383222	-97.010500	90.98
29	K42KO-D	CP	LD	42	2.0	44.383222	-97.010500	90.98
30	K45LV-D	CP	LD	45	2.0	44.383222	-97.010500	90.98
31	KTTM	LIC	DT	12	12.6	44.194167	-98.318333	98.28

Table 1: Off-Air TV Stations within 100 Kilometers of Project Area

[2] Definitions of service and status codes:
DT – Digital television broadcast station
LD – Low power digital television broadcast station
DC – Class A digital television broadcast station
TX – Translator station
LIC – Licensed and operational station
CP – Construction permit granted
CP MOD – Modification of construction permit
APP – Application for construction permit, not yet operational

[3] ERP = Transmit Effective Radiated Power

3. Impact Assessment

Based on a contour analysis of the licensed stations within 100 kilometers of the Crocker Wind Farm project, it was determined that four of the full-power digital stations, identified below in Table 2, may have their reception disrupted in and around the project. The areas primarily affected would include TV service locations within 10 kilometers of the wind energy project that have clear line-of-sight (LOS) to a proposed wind turbine but not to the respective station. After the wind turbines are installed, communities and homes in these locations may have degraded reception of these stations. This is due to multipath interference caused by signal scattering as TV signals are reflected by the rotating wind turbine blades and mast.

However, based on the low number of full-power TV channels available in the immediate vicinity of the project area, it is unlikely that off-air television stations are the primary mode of television service for the local communities. TV cable service, where available, and direct broadcast satellite service (DBS) are more likely the dominant modes of service delivery.

ID	Call Sign	Status	Service[4]	Channel	Transmit ERP[5] (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Nearest Turbine (km)
1	KABY-TV	LIC	DT	9	19.4	45.106389	-97.899444	1.54
2	KDLO-TV	LIC	DT	3	14.4	44.965556	-97.589722	14.24
3	KDSD-TV	LIC	DT	17	37.82	45.498333	-97.674722	39.98
26	KESD-TV	LIC	DT	8	15.0	44.337778	-97.228611	85.05

Table 2: Licensed Off-Air TV Stations Subject to Degradation

4. Recommendations

While TV signals are reflected by wind turbines, which can cause multipath interference to the TV receiver, modern digital TV receivers have undergone significant improvements to mitigate the effects of signal scattering. When used in combination with a directional antenna, it becomes even less likely that signal scattering from wind farms will cause interference to digital TV reception.

Nevertheless, signal scattering could still impact certain areas currently served by the TV stations mentioned above, especially those that would have line-of-sight to at least one wind turbine but not to a respective station antenna. In the unlikely event that interference is observed in any of the TV service areas, it is recommended that a high-gain directional antenna

[4] Definitions of service and status codes:
DT – Digital television broadcast station
LIC – Licensed and operational station

[5] ERP = Transmit Effective Radiated Power

be used, preferably outdoors, and oriented towards the signal origin in order to mitigate the interference.

Both cable service and direct broadcast satellite service will be unaffected by the presence of the wind turbine facility and may be offered to those residents who can show that their off-air TV reception has been disrupted by the presence of the wind turbines after they are installed.

5. Contact

For questions or information regarding the Off-Air TV Analysis, please contact:

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Web site:	www.comsearch.com

Appendix A

ID	Call Sign	Status	Service[6]	Channel	Transmit ERP[7] (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Nearest Turbine (km)
1	KABY-TV	LIC	DT	9	19.4	45.106389	-97.899444	1.54
2	KDLO-TV	LIC	DT	3	14.4	44.965556	-97.589722	14.24
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6	K32DK-D	LIC	LD	32	2.28	44.865556	-97.105833	53.84
7	K19KH-D	CP	LD	19	2.0	44.884889	-97.048306	57.07
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9	K22KF-D	CP	LD	22	15.0	44.884889	-97.048306	57.07
10	K23LI-D	CP	LD	23	15.0	44.884889	-97.048306	57.07
11	K30LU-D	CP	LD	30	2.0	44.884889	-97.048306	57.07
12	K39LN-D	CP	LD	39	2.0	44.884889	-97.048306	57.07
13	K14OP-D	CP	LD	14	1.0	45.339583	-97.071694	58.17
14	K25MD-D	CP	LD	25	1.0	45.339583	-97.071694	58.17
15	K32KJ-D	CP	LD	32	1.0	45.339583	-97.071694	58.17
16	K35KS-D	CP	LD	35	1.0	45.339583	-97.071694	58.17
17	K24DT-D	LIC	TX	24	0.674	45.474694	-98.521750	63.75
18	K24DT-D	LIC	LD	24	0.737	45.474722	-98.527222	64.10
19	K33MI-D	LIC	LD	33	15.0	45.474722	-98.527222	64.10
20	K39CZ-D	CP	LD	39	2.28	45.474722	-98.527222	64.10
21	K39CZ-D	LIC	LD	39	2.27	45.474722	-98.527222	64.10
22	K14OJ-D	CP	LD	14	15.0	45.461306	-98.589056	67.37
23	K15IR-D	CP	LD	15	15.0	45.461306	-98.589056	67.37
24	K35GR-D	LIC	TX	35	11.9	44.487500	-97.239167	70.59
25	K35GR-D	LIC	LD	35	6.76	44.487500	-97.239167	70.59
26	KESD-TV	LIC	DT	8	15.0	44.337778	-97.228611	85.05
27	K27LB-D	CP	LD	27	2.0	44.383222	-97.010500	90.98

[6] Definitions of service and status codes :
TV – Analog television broadcast station
DT – Digital television broadcast station
DS – Digital special temporary authority (STA)
LP – Low power analog television broadcast station
LD – Low power digital television broadcast station
CA – Class A analog television broadcast station
DC – Class A digital television broadcast station
DX – Digital auxiliary (backup) facility
TX – Translator station
LIC – Licensed and operational station
CP – Construction permit granted
CP MOD – Modification of construction permit
APP – Application for construction permit, not yet operational
STA – Special transmit authorization, usually granted by FCC for temporary operation

[7] ERP = Transmit Effective Radiated Power

ID	Call Sign	Status	Service[6]	Channel	Transmit ERP[7] (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Nearest Turbine (km)
28	K38NI-D	CP	LD	38	2.0	44.383222	-97.010500	90.98
29	K42KO-D	CP	LD	42	2.0	44.383222	-97.010500	90.98
30	K45LV-D	CP	LD	45	2.0	44.383222	-97.010500	90.98
31	KTTM	LIC	DT	12	12.6	44.194167	-98.318333	98.28
32	K40FZ-D	LIC	TX	40	13.5	44.339444	-96.768889	107.82
33	K40FZ-D	LIC	LD	40	7.014	44.339444	-96.768889	107.82
34	K50DG-D	LIC	LD	50	4.5	44.300833	-96.766667	110.94
35	K22KI-D	CP	LD	22	2.0	45.862111	-96.790583	111.84
36	K44KU-D	CP	LD	44	2.0	45.862111	-96.790583	111.84
37	K46LL-D	CP	LD	46	2.0	45.862111	-96.790583	111.84
38	K21LK-D	CP	LD	21	2.0	43.949417	-96.909833	135.18
39	K30LV-D	CP	LD	30	2.0	43.949417	-96.909833	135.18
40	K33LR-D	CP	LD	33	2.0	43.949417	-96.909833	135.18
41	NEW	APP	LD	48	2.0	43.949417	-96.909833	135.18
42	KWCM-TV	LIC	DT	10	50.0	45.167500	-96.000833	135.31
43	Q14A-D	CP	LD	14	1.0	43.703333	-97.548250	145.06
44	K30NS-D	CP	LD	30	1.0	43.703333	-97.548250	145.06
45	K40NS-D	CP	LD	40	1.0	43.703333	-97.548250	145.06
46	KDLV-TV	LIC	DT	26	1000.0	43.759167	-98.412500	146.72
47	K24LP-D	CP	LD	24	1.0	43.698917	-98.107722	146.89
48	K28NJ-D	CP	LD	28	1.0	43.698917	-98.107722	146.89
49	K42LT-D	CP	LD	42	1.0	43.698917	-98.107722	146.89
50	K46MT-D	CP	LD	46	1.0	43.698917	-98.107722	146.89

Table A: Off-Air TV Stations within 150 Kilometers of Project Area